

SECTION 8B

MISCELLANEOUS DOORS

1. APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

1.1 American Society for Testing and Materials (ASTM) Publications:

A 36-81a	Structural Steel
A 525-81	Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
A 572-81a	High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality
E 330-79	Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

1.2 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) Publication:

Handbook, Fundamentals (1981 and Errata)

1.3 American Welding Society, Inc. (AWS) Publication:

D1.1-81	Structural Welding Code - Steel
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1.4 National Electrical Manufacturers Association (NEMA) Standards:

ICS 2-1978 Incl Rev 1 thru 3	Industrial Control Devices, Controllers and Assemblies
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2. FIELD MEASUREMENTS: The Contractor shall verify all measurements at the building site and shall be responsible for dimensions, fitting, and the proper attachment of items directly connected with the door installation.

3. SUBMITTALS:

3.1 Shop Drawings: Shop drawings shall be submitted for approval in accordance with the SPECIAL PROVISIONS. A schedule showing the location of each door shall be submitted with the shop drawings. Drawings shall indicate elevations of each door type, details and method of anchorage; details of construction; method of assembling sections; location and installation of hardware; size, shape, and thickness of materials; joints and connections; details of tracks, rollers, fittings and other attachments.

3.2 Manufacturer's Instructions: Manufacturer's installation instructions shall be submitted for approval.

3.3 Certificate of Compliance: Certificate of compliance attesting that materials and assemblies meet specification requirements shall be furnished in accordance with the SPECIAL PROVISIONS.

4. HARDWARE: Hardware shall conform to SECTION: HARDWARE; BUILDER'S (GENERAL PURPOSE), unless otherwise specified.

5. PAINTING: Painting shall conform to SECTION: PAINTING, GENERAL.

6. PRODUCT DELIVERY, HANDLING AND STORAGE: Doors and frames shall be delivered, stored, handled, and installed so as not to be damaged or deformed. Abraded, scarred, or rusty areas shall be cleaned and painted immediately upon detection. Doors and frames stored at the site before installation shall be stacked on platforms or pallets and covered with tarpaulins or other suitable covering to provide weathertight enclosure while affording proper air circulation.

7. ROLLING AND SLIDING DOORS:

7.1 Design: Doors and hardware shall be designed for high frequency, industrial application, and to withstand a wind pressure of 20 psf of door area when tested in accordance to ASTM E 330. Doors shall be complete with operators, hoods, hardware and tracks, as applicable. Doors exposed to weather shall have flexible neoprene weatherstripping on jambs, top, and sill and between sections, if applicable, in a manner for easy replacement. Doors shall be mounted on exterior face of exterior walls to provide full opening of the doorway. Doors electrically operated shall have standard devices for securing operator chain or cable. Hoist chain shall be smooth and free of sharp edges. Steel door sections and hardware shall have a G90 coating conforming to ASTM A 525 and be phosphate treated. Exterior doors shall be insulated. Cellular plastic insulation shall not be exposed as an interior finish material. Insulation shall be of such thickness and material to provide a coefficient of heat transmission or U-value, Btu per hour, per square foot, per degree Fahrenheit temperature difference, through the completed door air to air, not in excess of 0.10 when determined for winter conditions using recognized methods in agreement with the ASHRAE Handbook, Fundamentals.

7.2 Rolling Steel Doors: Curtain shall be flat steel, interlocking slats. End locks shall be provided on both ends of alternate slats; windlocks on both ends of every sixth slat. Curtain shall roll up on a drum supported on brackets and shall be balanced by helical springs. Doors shall be electrically operated.

7.3 Horizontal Sliding Steel Blast Doors: Doors shall be electrically operated, constructed of steel plate, and supported by overhead wall-mounted track. Doors shall be furnished complete with all hardware, tracks, guides, and accessories required for complete operation.

7.3.1 Construction: Doors shall be constructed of 1-inch steel sheet conforming to ASTM A 572, Grade 50, steel tubes, TS 5 by 2 by 1/4, and 1/4-inch steel sheet conforming to ASTM A 36. Fabrication and assembly shall be done in the shop to the greatest extent possible. All exposed edges shall be chamfered and all welds shall be ground smooth. The

finished door shall be free of warps, bows, and bulges and shall fit the frame when closed with a maximum gap between door and frame of 1/8 inch. Certification shall be furnished that each welder is qualified in accordance with AWS D1.1.

7.3.2 Hardware: Doors shall be mounted on a heavy-duty overhead track complete with brackets and end stops. The sliding door shall be hung from four-wheel and two-wheel ball-bearing hangers operating on a track. End stops shall be furnished for the door.

7.3.3 Shop Finish: Doors and hardware shall be given one coat of rust-inhibiting paint at the factory. Finish painting shall be in accordance with SECTION: PAINTING, GENERAL.

7.3.4 Installation: Doors shall be installed by the manufacturer or his authorized representative, in accordance with the contract drawings, shop drawings, and manufacturer's directions. Anchors and inserts for brackets, guides, and other work shall be accurately located. Upon completion, doors shall be lubricated and adjusted to operate freely.

7.3.5 Electric Power Operations: Electric power operations, as specified in paragraph ELECTRIC OPERATORS, shall be furnished complete as indicated.

7.3.6 Tests: After installation of the doors, the Contractor shall connect temporary power of the electric power operator and the doors shall be operated in the presence of the Contracting Officer or his authorized representative.

7.4 Hinged Pedestrian Blast Doors: Blast doors shall be designed and constructed of formed sheet steel and shapes and faces reinforced to resist the dynamic stresses specified. Doors shall show no evidence of warpage or distortion and shall be fully operable after receiving the specified overpressure. The calculated rebound shall be 100 percent. Deflection shall not exceed 1/240 of the span. Door manufacturers shall furnish calculations prepared by a registered engineer certifying conformance of door frames and hardware with overpressure specified together with complete shop drawings showing construction details.

7.4.1 Shop Painting: Surfaces shall be cleaned, filled, ground smooth where necessary, and given a shop coat of paint standard with the manufacturer. Finish painting shall be in accordance with SECTION: PAINTING, GENERAL.

7.4.2 Workmanship: The finished work shall be rigid, neat in appearance, and free from defects, warp, or buckle. Molded members shall be sharp in detail, straight, and true. Corner joints shall be coped or mitered, well formed, and in true alignment. Exposed welded joints shall be dressed smooth.

7.4.3 Reinforcement: Frames shall be designed and constructed of pressed steel with reinforcing anchors to resist external blast forces as specified. Frames shall be factory reinforced and template tapped for hardware. Steel materials shall conform to the standards of the American

Institute of Steel Construction. Welding of the door and frame components shall be in accordance with AWS D1.1. Welds shall be as required by the dynamic analysis criteria.

7.4.4 Hardware: Hardware for hinged pedestrian blast doors shall be furnished by the door manufacturer. Doors, frames, and hardware shall be designed to withstand the design load as specified in paragraph External Design Loading.

7.4.5 Hardware Sets: Hardware sets for pedestrian blast doors shall be as follows:

a. Doors 13 and 35: hinges
exit device
closer
stop

b. Doors 34 and 36: hinges
lockset
flushbolts
stop
astragal

c. Keying: All doors shall be keyed in accordance with SECTION: HARDWARE; BUILDERS' (GENERAL PURPOSE).

7.4.6 External Design Loading: External design loading shall be as follows:

BLAST

Ballast Pressure	16.0 psi
Blast Duration	9.0 milliseconds
Blast Impulse	72 psi-ms

7.5 Electric Operators: Operators shall be furnished complete with electric motor, reduction gears, magnetic brake, friction clutch, emergency release for manual operation, heavy duty roller chain, controls, limit switches, and other accessories. The operator shall be designed to permit motor removal without affecting limit-switch timing on emergency auxiliary operators. A manually operated crank-gear or chain-gear mechanism shall be provided on doors other than horizontal sliding doors, to permit manual operation. Manual operation shall not be through the gear box.

7.5.1 Motor: Motor shall be totally enclosed, 480 volt, 3 phase, 60 Hz, constant duty type, instantly reversible, capable of moving door at not less than 3/4 foot per second and designed for high frequency operation. Motor shall have a short-time rating of not less than 5 minutes.

7.5.2 Controls: Each door motor shall have an enclosed reversing across-the-line type magnetic starter having thermal overload protection, solenoid-operated brake, limit switches, and four remote-control switches.

The starter shall conform to NEMA No. ICS 2. Remote-control switches shall include a pull cord and shall be a three-button type with the buttons marked "OPEN", "CLOSE", and "STOP." CLOSE buttons shall be momentary-contact type requiring constant pressure to maintain motion of the door. Pushbuttons shall be full-guarded type to prevent accidental operation. Switches mounted on the exterior of a building shall be weatherproof key-operated type having corrosion-resistant cast metal cover. Switches mounted on the interior shall be explosion proof, class as required by SECTION: ELECTRICAL WORK, INTERIOR. Limit switches shall automatically stop the doors at their fully opened and closed positions. Positions of the limit switches shall be readily adjustable.

7.5.3 Transformers: Transformers shall be provided to reduce the voltage on the control circuits to a maximum of 120 volts.

7.5.4 Safety Device: The bottom edge of electrically operated doors shall have a safety device that will immediately reverse the door movement upon contact with an obstruction. The safety device shall be installed across the entire width of the door and shall not substitute for a limit switch.

7.5.5 Electrical Work: Electric-motor-driven devices required for operation of the doors and any wiring required but not indicated on the electrical drawings shall be provided under this section. Electrical equipment and wiring shall conform to SECTION: ELECTRICAL WORK, INTERIOR. Flexible connections between door and fixed supports shall be type SO cable. The cable shall have a spring-loaded automatic takeup reel or equivalent device.

7.6 Hoists: Hoists shall be complete with reduction gears, heavy duty chains, and locking mechanism. Pull on hoist chain to activate door shall not exceed 35 pounds. Hoist shall contain governor for controlling descent rate of door.

8. INSTALLATION: Frames and accessories shall be installed plumb, level, and rigid. Doors shall be installed and lubricated, as recommended by the manufacturer, to operate freely and easily.